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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,241	03/10/2004	Mark Muenzer	074313.0107	2985

7590 11/17/2005  
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EXAMINER

THOMAS, LUCY M

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/797,241	<b>Applicant(s)</b> MUENZER ET AL. 	
	<b>Examiner</b> Lucy Thomas	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/10/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1, 6 and 13-15 are objected to because of the following informalities:  
Claim 1 is indefinite as the claim language may be interpreted such that the power switches are parallel which is misdescriptive. Claims 6 and 13 recites the limitation "the current gradient" in line 1 and line 8 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the voltage drop across internal and/or external leakage inductances" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the current rise" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 7-10, 16 and 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Marquardt et al. (US 5,650,906). Regarding Claim 7, Marquardt et al. discloses a circuit arrangement for limiting an overvoltage at a freewheeling device arranged in parallel with a semiconductor power switch (Figures 1 and 2), comprising at

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least a first and a second semiconductor power switch T1, T2 each parallel-connected with a freewheeling device 24, 26 being connected in series, an output terminal R (S, T) arranged between the first and second semiconductor power switch for coupling with to an inductive load, and a feedback path (see path from C to G in Figures 1 and 2) between the output of each semiconductor power switch and its control terminal (Column 3, lines 40-60).

Regarding Claim 8, Marquardt et al. discloses a circuit arrangement, wherein a feedback path has at least one component 20 or 22 (Figure 1), which permits a driving of the control terminal only above a threshold voltage, so that only voltages greater than a predetermined threshold value are fed back to the control terminal. Regarding Claim 9, Marquardt et al. discloses a circuit arrangement, wherein the feedback path has a component 28 (Figure 2), via which a feedback to the control terminal is effected in a manner proportional to the voltage rise at the freewheeling device. Regarding Claim 10, Marquardt et al. discloses a circuit arrangement, wherein two diodes 16, 20 or 18, 22 (see Figure 1) connected in antiparallel are used as the components in the feedback path. The reference has Zener diode elements. Regarding Claim 16, Marquardt discloses an IGBT power transistor T1, T2 as the semiconductor power switch (Figures 1 and 2, Column 2, lines 4-8).

Regarding method Claims 1-6, the recited method steps would necessarily be performed when implementing the circuit arrangement for limiting the overvoltage at a freewheeling device recited in Claims 6-10. The device recited in Claims 6-10 would necessarily operate in the recited manner.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Erckert (US 6,100,742). Regarding Claim 11, Marquardt fails to disclose a capacitor used as the component in the feedback path. Erckert discloses a capacitor 34 (Figure 1), C2 (Figure 5). It would have been obvious to those skilled in the art to modify Marquardt's circuit to include a capacitor in the feedback path as taught by Erckert because capacitors respond to higher frequency events (like transients), and in case of overvoltages across the freewheeling diode, aid the turn-on of the power transistor.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Goesser et al. (US 6,531,908). Regarding Claim 12, Marquardt fails to disclose a parallel circuit comprising Zener diodes and an external capacitor used in the feedback path. Goesser et al. discloses a parallel circuit comprising Zener diodes and an external capacitor used in the feedback path (see Figure 2). It would have been obvious to those skilled in the art to modify Marquardt's circuit to include a parallel circuit comprising Zener diodes and an external capacitor in the feedback path as taught by Goesser, because both the Zener diode and the capacitor increase the accuracy of transient response with respect to voltage threshold

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and frequency and in case of overvoltages across the freewheeling diode to switch-on the power transistor, and a parallel arrangement provides a faster response.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Maly et al. (US 6,861,835). Claim 13 basically recites combined limitations of Claims 7 and 8, except the recitation of a threshold value of the current gradient, which is objected to in the beginning of this Office Action. Marquardt discloses the need for minimizing the parasitic inductances (Column 1, lines 18-22), but fails to disclose the current gradient limitation. Maly discloses the current gradient measurement and the stray or leakage inductances calculation for the protection of power transistor switches. It would have been obvious to those skilled in the art to modify Marquardt's circuit to include current gradient limitation as taught by Maly, to protect the circuit from the reverse current spike and the additional overvoltage component due to leakage inductances which is equal to the measured current gradient times the leakage inductance.

8. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marquardt et al. (US 5,650,906) in view of Maly et al. (US 6,861,835) and McKenzie (US 5,336,985). Regarding Claims 14 and 15, neither Marquardt or Maly disclose a feedback wherein a voltage drop across leakage inductances is utilized (Claim 14), with a transformer to feedback the current rise (Claim 15). McKenzie discloses a feedback wherein a voltage drop across leakage inductances is utilized, with a transformer 26 in the feedback path (see Figure 1). It would have been obvious to those skilled in the art to modify Marquardt's and Maly's circuit to include a feedback

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wherein a voltage drop across the leakage inductances is utilized, with a transformer in the feedback path, as taught by McKenzie, because the use of feedback produces a more accurate response in circuits having sudden changes in current levels.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LT  
November 7, 2005



PHUONG T. VU  
PRIMARY EXAMINER